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Editorial Comment

Is Vitamin D Supplementation Truly A Cure-All?

Vitamin D has been considered as a vital and required supplement for bone health. Existing evidence suggests that vitamin D deficiency is also associated with a host of other conditions such as cardiovascular disease,¹ cancers,² frailty,³ dementia,⁴ and all-cause mortality.⁵ However, evidence indicating the potential benefit of vitamin D supplementation remains inconsistent despite the biological plausibility. In this issue of the journal, Sohng and Lee⁶ reported an experimental study in which they analyzed the effects of 12-week vitamin D supplementation on depression, cognitive function, and physical function in vitamin-D-deficient elderly individuals living alone. The authors concluded that vitamin D supplementation was associated with an improvement in vitamin D levels, muscle mass, and walking speed. Recent research has also extensively focused on the cardiovascular benefits of vitamin D supplementation. Vitamin D may exert protective effects in cardiovascular disease by improving the risk factors, including the extent of arteriosclerosis, high blood pressure, elevated parathyroid hormone, dyslipidemia, and inflammation.^{7,8} Recent meta-analyses and trial sequential analyses have demonstrated that vitamin D supplementation had no clinically relevant effects on fractures, falls, and bone mineral density, except for the prevention or treatment of rickets and osteomalacia in high-risk groups.⁹ Furthermore, a systematic review¹⁰ on over-the-counter supplement interventions to prevent cognitive decline demonstrated no benefit of vitamin D plus calcium for mild cognitive impairment or Alzheimer-type dementia. Several explanations have been proposed for this lack of meaningful effects of vitamin D supplementation, which include the extremely high levels of baseline 25(OH)D of trial participants, the extremely low doses of vitamin D supplements, inadequately designed trials, and a probable therapeutic time window relevant to vitamin D therapy and the development of diseases. Additional studies with a better design are required to address this issue to practice toward a successful therapy.

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